

# Data Evaluation Report on the Acute Toxicity Range-Finder Test of EUP NSPW-L30SS to Freshwater Invertebrates – *Daphnia magna*

PMRA Submission Number {.....}

EPA MRID Number 50425700

<b>Data Requirement:</b>	PMRA Data Code	{.....}
	EPA DP Barcode	444491
	OECD Data Point	{.....}
	EPA MRID	50425700
	EPA Guideline	

**Test material:** NSPW-L30SS

**Purity:** 1% nanosilver

**Primary Reviewer:** Donna M. Randall, Senior Biologist  
USEPA/OCSP/OPP/AD

**Date:** 12/22/2017



**Secondary Reviewer(s):** {.....}  
{EPA/OECD/PMRA}

**Date:** {.....}

**Reference/Submission No.:** 1008195

**EPA PC Code** 072599

**Date Evaluation Completed:** 12/21/2017

**CITATION:** Mikulsa, Janelle. 2017. NSPW-L30SS *Daphnia magna* 48-Hour Acute Toxicity Range-Finder Test. Performed by STILLMEADOW, Inc., Sugar Land, TX for Poly-Technical Solutions, Ltd.

## **EXECUTIVE SUMMARY:**

The 48-hour acute toxicity range-finding test of the end use product NSPW-L30SS containing an amorphous-silica nanosilver composite substance to *Daphnia magna* was studied under static conditions. Daphnids were exposed to a blank control, NSPW-L30SS nominal concentrations of 0.1, 1.0, 10, 100, and 1000 mg/L (nominal 0.0012, 0.012, 0.12, 1.2, and 12 mg Ag/L), and nominal silver nitrate (AgNO<sub>3</sub>) concentrations of 0.1, 1.0, 10, 100, and 1000 mg/L (nominal 0.064, 0.64, 6.4, 64, 640 mg Ag/L) for 48 hr. Water hardness as calcium carbonate (CaCO<sub>3</sub>) was 90 mg/L in the control and 75 mg/L in the NSPW-L30SS and silver nitrate test medium, this lower hardness than standard guideline conditions reflects a modification requested by the Agency. The range-finder test included a silver nitrate reference test. Mortality and sublethal effects were observed daily. The 48-hour EC<sub>50</sub> was 0.550 mg NSPW-L30SS/L (0.0066 mg Ag/L) on a nominal basis and was 0.050 mg AgNO<sub>3</sub>/L (0.0318 mg Ag/L). The 48-hr NOAEC based on mortality was 0.10 mg NSPW-L30SS/L (0.0012 mg Ag/L) on a nominal basis and was <0.1 mg AgNO<sub>3</sub>/L (<0.064 mg Ag/L) on a nominal basis.

While several of the range-finder test exposure conditions and monitoring differ from those required for an acceptable definitive test, they are appropriate for a range-finder test. From the range-finder nominal results, analytical methods able to quantitate ionic silver, dissolved silver, total silver of approximately 0.1 to 0.5 ppb are needed for both the NSPW-L30SS and silver nitrate monitoring in a definitive test. The reviewers' response on method sensitivity assumes that any renewal of dosed test medium that may be needed in the definitive test does not result in lowering of the nominal endpoint values substantially. The range-finder test was conducted as a static test, and there is insufficient monitoring in the range-finder test or from other testing reported in the range-finder report to determine if renewal is or is not required in the definitive test. Optical methods for monitoring particles would need to be able to detect the number of particles that this equates to in terms of amorphous-silica nanoparticles as though all silver NPs were bound. These reviewers had insufficient information on number of amorphous-silica particles or silver nanoparticles to perform this estimate.

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## **I. MATERIALS AND METHODS**

**GUIDELINE FOLLOWED:** USEPA. 2016. OCSPP 850.1010: Aquatic Invertebrate Acute Toxicity Test, Freshwater Daphnids. EPA 712-C-16-013.

**COMPLIANCE:** Signed and dated GLP, Quality Assurance, and No Claim of Data Confidentiality statements were provided.

### **A. MATERIALS:**

**1. Test material** NSPW-L30SS

**Description:** Aqueous dispersion of amorphous silica nanosilver composite

**Lot No./Batch No. :** Lot L30SS170410 / Batch 1

**Purity:** 1.2% nanosilver

**Stability of compound under test conditions:** Range-finder test, no monitoring was conducted in NSPW-L30SS or in dosed media during the study. No pretest investigation results were provided in the range-finder report that would provide weight-of-evidence.

**Storage conditions of test chemicals:** Held at room temperature.

### **2. Test organism:**

**Species:** *Daphnia magna*

**Age at test initiation:** <24 hours

**Source:** STILLMEADOW, Inc.

### **B. REVIEWER COMMENTS:**

Several study modifications identified by the Agency in a protocol review (memoranda dated July 27, 2017<sup>1</sup>, September 7, 2017<sup>2</sup>) were not included in the range-finder test. Because this is a range-finder test, the factors not included were not critical but should be taken into consideration when deciding what are the appropriate analytical methods and sensitivity to use because toxicity results might be lower under renewal conditions where renewal is needed to maintain dispersion within guideline variability limits.

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1 DP Barcode 44138[6]: July 27, 2017 Memorandum from D. Randall and A. Byro  
USEPA/OCSPP/OPP/AD/RASSB to J. Herbert, S. Murasaki, Z. Bain USEPA/OCSPP/OPP/AD/RMB I, Re: Protocol Review of an acute *Daphnia magna* toxicity test with NSPW-L30SS, 6 pp.

2 DP Barcode 44[1386]: September 7, 2017 Memorandum from D. Randall and A. Byro  
USEPA/OCSPP/OPP/AD/RASSB to J. Herbert, S. Murasaki, Z. Bain USEPA/OCSPP/OPP/AD/RMB I, Re: Review of revised test protocol for an acute *Daphnia magna* toxicity test with NSPW-L30SS, 4 pp.